Appendix N

Roadway and Rail Traffic Analysis

APPENDIX N
TRAFFIC FORECASTS AND IMPACT ANALYSIS
PORT OF GULFPORT EXPANSION PROJECT

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Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
ARRA	American Recovery and Reinvestment Act
CBD	Central Business District
CSX	CSX Corporation
FHWA	Federal Highway Administration
GRPC	Gulf Regional Planning Commission
HCM	Highway Capacity Manual
I-10	Interstate Highway 10
KCS	Kansas City Southern Railway
LOS	level of service
LRP	Long-range Plan
MDOT	Mississippi Department of Transportation
MEV	million entering vehicles
mph	miles per hour mph
MSPA	Mississippi State Port Authority
MULTIPLAN	Mississippi's Unified Long-range Transportation Infrastructure Plan
PGEP	Port of Gulfport Expansion Project
Port	Port of Gulfport
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
TEUs	Twenty-foot Equivalent Units
TIGER	Transportation Investment Generating Economic Recovery
TWLTL	two-way left-turn lane
US	U.S. Highway

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1.0 AFFECTED ENVIRONMENT

1.1 ROADWAY AND RAIL TRAFFIC

This section describes the recent history and existing conditions pertaining to transportation demand and supply in and around the Port of Gulfport (Port). Since the Port is an intermodal freight transfer center, this description addresses both freight and passenger transportation modes.

The project study area for roadway transportation impacts extends from Landon Road north of Interstate Highway 10 (I-10) to U.S. Highway (US) 90 on the south, and from US 49 on the east to Canal Road and 30th Avenue on the west. This study area covers all roadways that can be used by Port commuters and trucks that access intercity highways such as I-10 and US 49. This study area also fully encompasses the Mississippi Department of Transportation's (MDOT) planned I-310 Project, and includes all roads that would be directly affected by its completion.

1.1.1 Project Location and Access

The entire Port site is situated south of US 90 (West Beach Boulevard), which runs along the Gulf Coast and between 30th Avenue and US 49 (25th Avenue). The Gulfport Central Business District (CBD) is situated immediately north of US 90, and a marina and recreational beach area are located just east of the site.

The current primary points of vehicular access to the Port are at signalized intersections along US 90 at 30th Avenue and at US 49 (25th Avenue). A secondary unsignalized access point is also available between these intersections at Copa Boulevard.

The freight rail (Kansas City Southern [KCS] Railway) connection to the Port is also situated at Copa Boulevard. The rail line splits into two separate alignments just north of US 90. The west alignment extends into the main West Pier of the Port. The east alignment extends to the smaller East Pier. North of the Port, the KCS rail line extends inland to the north and provides cross connection access to the east-west CSX Corporation (CSX) freight rail line that runs along the Gulf Coast.

1.1.2 Transportation Demand

The Port generates travel demand for both freight and passengers. The passenger travel is associated with site workers and associated support services. As an intermodal Port, freight is accommodated by truck, freight rail, and ocean-going freight vessels.

1.1.2.1 Freight Demand

Prior to Hurricane Katrina (August 2005), the tonnage of freight handled by the Port had been growing steadily. From 2002 to 2005, freight traffic handled by the Port grew steadily from 2.1 to 2.5 million short

tons of cargo per year. However, after the hurricane, freight traffic declined to 1.5 million short tons in 2006, or 60 percent of the 2005 level due to capacity limitations from hurricane damage. In terms of container cargo volume, the number of Twenty-foot Equivalent Units (TEUs) grew from 154,000 in 2002 to 230,000 in 2005 before dropping to 170,000 in 2006. The number of vessel calls also declined from a range of 352 to 384 vessels per year between 2002 and 2005 to 225 vessels in 2006 (Mississippi State Port Authority [MSPA], 2006).

Improvements to the Port would result in additional annual freight transport activity, which would increase the number of trains of cargo using the KCS rail line. The previously completed speed improvements to the KCS rail line have generally reduced the blockage time at highway rail grade crossings. Delays in the southern limits of the line, from US 90 to 33rd Street (approximately the Gulfport Rail yard) are expected to decrease by 37 seconds, due to train lengths being shortened from 2,940 to 2,400 feet. Between 33rd Street and Polk Street crossing times are expected to increase, as longer trains (3,900 feet) leave the Gulfport Rail yard and travel north at 10 mph initially. These trains eventually increase their speed to 20 mph at Polk Street and 49 mph at Dedeaux Road, according to the KCS Railway Environmental Assessment. Because of the increase in travel speed for trains north of the Gulfport Rail yard, crossing delays may decrease by 67 to 146 seconds per crossing. Additional highway rail grade crossing blockages due to added train traffic could produce congestion issues if they occurred during daytime hours. However, since Port-related trains can only access the track between 10 PM and 7 AM, when traffic volumes are very low, there is no potential for congestion at highway-rail grade crossings. Furthermore, the analysis projects the duration of delays and frequency of delays caused by the additional train trips generated by the Proposed Project Alternative should fall within the same thresholds as the No-Action Alternative. Therefore, impacts associated with changes in rail transport activities at the Port are expected to be the same as described for the No-Action Alternative.

Although the Port's annual cargo volume is not back to pre-Katrina levels, it continues to grow. In 2010, the MSPA handled more than 2.15 million tons of cargo, 223,740 TEUs of containerized cargo, and 225 ships. Based on 2009 data from MSPA, top exports were containerized cargo (90 percent of tonnage) and linerboard. The total weight of exports was 650,000 short tons in 2009. Top imports were fruit (60 percent of tonnage), ores (30 percent), and containers (10 percent). The total weight of imports was 1.4 million short tons. Thus the balance of trade from a weight perspective consists of about 68 percent imports to 32 percent exports (MSPA, 2011). The Port has generally maintained the 200,000-TEU level of volume since 2003, representing about 0.5 percent of the U.S. total. Hurricane Katrina caused a significant disruption in volume and shares of the U.S. total, with declines in Gulfport as well as New Orleans in 2005 (American Association of Port Authorities, 2010).

Currently, 95 percent of container freight imports leave the Port on rubber tires with more than 40 truck lines servicing the Port daily (*Gulfport News*, 2010; World Trade, 2010). However, Mississippi Governor Haley Barbour announced in February 2010 that improvements to the freight rail line (KCS) between the Port and Hattiesburg (connecting to the Norfolk Southern mainline) had been funded by the American Recovery and Reinvestment Act (ARRA) of 2009. These recently completed improvements increase

freight rail capacity and mobility to the Port to help accommodate a larger portion of land-side freight traffic growth by rail.

1.1.2.2 Passenger Demand

At the current volume of 208,000 TEUs per year, the Port is staffed by 1,200 direct jobs, and generates 486 indirect jobs, and 540 induced jobs (MSPA, 2013a). According to the 2030 Harrison County Comprehensive Plan, over 90 percent of Harrison County residents travel to work in a personal vehicle alone, or as part of a carpool. Two-thirds of Harrison County residents commute more than 15 minutes to work. Keesler Air Force Base, the Naval Construction Battalion Center, and Beau Rivage Casino are the county's three biggest employers, and they are among the largest individual sources of travel to and from Biloxi and Gulfport (Harrison County, 2008).

1.1.3 Surface Transportation Network

The surface transportation network in the study area consists of an interstate highway, U.S. highways, state highways, and county and local roads that provide access to the Port, as well as private freight rail lines. Figure 1 shows a City of Gulfport roadway functional classification map that illustrates major thoroughfares and freight rail lines connecting to the Port (located on the small peninsulas along the Gulf Coast at the bottom of the map). Red routes indicate principal arterials providing access to the Port, while the blue route is I-10. I-310 is a proposed highway that is included in the Gulf Coast Regional Plan, and MDOT considers it as part of their No-Build scenario for future planning efforts. However, due to litigation, this project has been delayed, and it is unknown when the project will move forward. This transportation network accommodates both passenger travel flows by different travel modes for Port workers and freight flows that are transported by truck or rail to points inland. Though not shown on the map, ocean going vessels must approach the Port using a dredged shipping channel through the otherwise shallow Mississippi Sound. Thus the capacity of this channel is one of the issues affecting the potential for freight shipping growth at the Port.

1.1.3.1 Roadways

The following sections provide a summary of the existing conditions for the major roadways in the Project study area. These sections present historic traffic count data obtained from MDOT. In reviewing this information, it is important to note that most of the MDOT traffic counts are a product of an estimation procedure derived from a sample of traffic counts, not from a complete set of field traffic counts conducted every year. Thus, traffic count trends, at any given location, tend to follow previous trends and trends among other roads in the area until another traffic count is taken at the subject location to correct the estimated trend. When this occurs, there could be a dramatic shift in the level of traffic that occurs from before a traffic count year to the count year because the estimation procedure was not producing the correct estimate of the actual trend. For this reason, observed trends and shifts in the traffic count history need to be interpreted with these limitations in mind. In Tables 1, 5, 6, and 7, actual traffic counts are underlined while estimates are not.

Source: Gulf Regional Planning Commission (2003).

Figure 1
City of Gulfport Roadway Network and Classifications

1.1.3.1.1 US 49

US 49 (also known as 25th Avenue in the Gulfport CBD) is a designated hurricane evacuation route, runs north-south, and connects Gulfport to Hattiesburg, Jackson, and other locations via intersecting highways. Within the study area, US 49 connects the cities of Gulfport, Landon, New Hope, and Orange Grove. US 49 is the primary point of access to a major retail activity center just north of I-10 (Crossroads Center), the Gulfport-Biloxi International Airport south of I-10, and the Gulfport CBD north of US 90. The US 49 interchange with I-10 serves as an anchor for large commercial developments with numerous large retail stores and restaurants located in the immediate area (MDOT/Federal Highway Administration [FHWA], 2008). These commercial developments attract local residents as both an employment and shopping locale. On the south, US 49 ends on the Gulf Coast at US 90, and the south leg of this intersection is one of the entry roadways into the Port.

The existing US 49 roadway has a six-lane width from Clark Road (2.9 miles north of I-10) to US 90, a distance of 7.5 miles. However, the segment within the Gulfport CBD from 28th Street to US 90 has four designated through travel lanes, while the outer two lanes are used for right turns and as safety buffers for on-street angle parking at this time. There are four lanes north of Clark Road. The roadway is divided by either a physical median or a two-way left-turn lane over the entire length. Throughout the study area, US 49 has numerous access points, including several signalized and unsignalized intersections and a clover leaf interchange at I-10. The posted speed limit on the urban section of US 49 is 45 miles per hour (mph).

The KCS rail line runs north-south parallel to US 49 on the west side throughout Gulfport. South of I-10, the rail line is two to three blocks west of US 49, thus reasonably outside the area of influence of US 49 intersections. North of I-10, the rail line comes within 300 feet of US 49 at cross street intersections with Landon Road (at Crossroads Parkway), O'Neal Road, Clark Road, and Duckworth Road. All of these are currently two-lane roads as they cross the tracks.

As indicated in Table 1, 2012 Average Annual Daily Traffic (AADT) volumes on US 49 within the study area range from 15,000 to 58,000. The 2012 AADT volumes are smallest close to the Port and increase heading north towards I-10. These data suggest that a large proportion of the traffic on US 49 is generated within the urbanized area of Gulfport. US 49 provides direct access to shopping centers, industrial parks, the Gulfport-Biloxi International Airport, the Gulfport CBD, and the Naval Construction Battalion Center, as well as beach front recreation opportunities and the Port. Traffic volumes on US 49 north of I-10, which ranged from 48,000 to 58,000 in 2012, are also high relative to the section immediately north of the Port and the Gulfport CBD (north of 28th Street). Residential development north of I-10 has increased rapidly over the past 2 years, which has contributed to increased traffic volumes in the area (MDOT/FHWA, 2008). Traffic volumes in Table 1 generally depict stagnant or decreasing growth trends between 2007 and 2012 in most locations.

Table 1
Historical Two-Way AADT on US 49 within the Study Area

Jurisdiction	Location	2012	2011	2010	2009	2008	2007
Gulfport	North of Orange Grove Road	48,000	47,000	68,000	66,000	67,000	72,000
Gulfport	South of Dedeaux Road	48,000	47,000	64,000	62,000	63,000	65,000
Gulfport	North of I-10	58,000	63,000	64,000	62,000	63,000	65,000
Gulfport	South of I-10	34,000	34,000	60,000	59,000	60,000	64,000
Gulfport	South of Creosote Road	55,000	55,000	55,000	54,000	55,000	65,000
Gulfport	South of Airport Road	58,000	51,000	51,000	50,000	45,000	46,000
Gulfport	South of MLK Boulevard	47,000	47,000	47,000	46,000	47,000	48,000
Gulfport	South of John Hill Blvd.	43,000	43,000	47,000	46,000	47,000	48,000
Gulfport	North of 28th Street	38,000	41,000	42,000	40,000	38,000	39,000
Gulfport	South of 25th Street	26,000	26,000	26,000	26,000	31,000	32,000
Gulfport	North of 14th Street	15,000	32,000	32,000	31,000	32,000	33,000

Source: MDOT (2012).
Underlined volumes are actual traffic counts, others are estimated from trends by MDOT.

Results of an accident analysis contained in the *SR 601 Traffic and Accident Analysis*, November 2007, suggest crash rates on US 49 are relatively high. Crash rates have steadily increased throughout the corridor from 2001 to 2003. These increases are particularly significant in Harrison County, where the crash rate was nearly five times greater in 2003 than in 2001. Forty-nine percent of the crashes in Harrison County in 2003 were rear-end collisions. This high rate of rear-end collisions is consistent with congested traffic conditions. Congested roadway conditions increase the potential for vehicular collisions and personal injuries. In Harrison County, the number of injuries resulting from these collisions increased with the accident rate. There were 146 injuries recorded in 2003, compared to 54 in 2001 (MDOT/FHWA, 2008).

One location on US 49 within the study area was listed in the FHWA's Mississippi 2010 Five Percent Report, which identifies no less than 5 percent of roadway locations exhibiting the most severe safety needs (FHWA, 2010). Table 2 summarizes relevant accident statistics based on data from the period 2005 through 2009 including the crash rate per million entering vehicles (MEV). The accident Severity Index ranges from 0 to 9, where 0 indicates all property damage (minor) accidents, while 9 indicates all fatal accidents. Though the index is relatively low overall, the occurrence of fatal accidents will always result in the application of safety improvement measures. Mitigation measures have already been applied to reduce accidents at this location.

Table 2
Five Percent 2010 Accident Report Data for US 49 Locations within Study Area

Location	Crashes	Fatalities	Injuries	Crash Rate (MEV)	Severity Index
US 49 at Polk Street	5	2	15	2.22	0.67

Source: FHWA (2010).

In addition to connecting the Port to I-10, US 49 also connects to I-59 in Hattiesburg and I-55 in Jackson. The roadway has at least four lanes between Gulfport and Jackson and is divided in most locations. This corridor has a high priority for improvements in Mississippi's Unified Long-range Transportation Infrastructure Plan (MULTIPLAN), and is among the Corridors of Statewide Significance. The MULTIPLAN identifies numerous corridor improvement strategies including capacity expansion, bypass routes, and bicycle and pedestrian improvements (I-10 to US 90) (MDOT, 2011a).

North of Gulfport, US 49 is classified as a rural principal arterial. According to the Bureau of Transportation Statistics, in 2005, the fatality rate on rural principal arterials was 45 percent higher than rural interstate highways. This is partly due to the better physical conditions of the roadway and control of access on interstate highways. The 2004 *Conditions and Performance Report* compared fatalities in 1994 through 2002; the report found that the fatality rate (fatalities per 100 million vehicle miles) on rural interstate highways has remained lower than other rural functional classes (MDOT/FHWA, 2008). Thus, an element of the MULTIPLAN includes upgrading US 49 to Interstate Highway Standards from Gulfport to Jackson.

Rural US 49 is utilized by trucks transporting freight from the Gulf Coast cities and ports to other destinations in the U.S. As noted in Table 3, truck traffic over the entire US 49 corridor is expected to increase 44 percent in rural areas between 2006 and 2030 (MDOT, 2011a).

Table 3
Freight Corridor Profile for US 49

Highway Corridor						
Name	Length (miles)	Truck Volume	Relative Performance	Percent Rail/Truck	Rail Line	2006–2030 Growth
US 49	334	7,259,049	Poor, highest portion of segments with average speed <50 mph	7.6/92.4	Canadian National mainline (Jackson-Hattiesburg), KCS branch (Hattiesburg-Gulfport)	44%

Source: MDOT (2011a).

1.1.3.1.2 Interstate 10

East-west travel patterns on the Mississippi Gulf Coast are accommodated by I-10 and US 90. These roadways stretch the extent of the three Mississippi Gulf Coast counties and are the only continuous east-west facilities that cross all bays and estuaries along the coast (Coast Transit Authority and MDOT, 2011). I-10 is a major economic corridor that stretches coast-to-coast across the southern U.S., and one of four transcontinental east-west Interstate routes in the U.S. The corridor spans eight states: California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Alabama, and Florida. I-10 is 4.7 miles north of the Port and provides a route for trucks to distribute products to 75 percent of U.S. markets within 24 hours (City of Biloxi, 2008a). According to information from the National I-10 Freight Corridor Study, the economic impact of freight transported along the corridor is $1.38 trillion dollars (Harrison County, 2008). Table 4 presents the freight corridor profile for I-10 from the MULTIPLAN (MDOT, 2011a). Based on the MULTIPLAN study, freight traffic growth on I-10 is expected to increase 50 percent between 2006 and 2030.

Table 4
Freight Corridor Profile for I-10

Highway Corridor						
Name	Length (miles)	Truck Volume	Relative Performance	Percent Rail/Truck	Rail Line	2006–2030 Growth
I-10	77	5,410,134	Poor, lowest average speed for interstate	28.7/71.3	CSX Gulf Coast line	50%

Source: MDOT (2011a).

I-10 has six lanes from County Farm Road (west of US 49) to I-110 in Biloxi and four lanes outside these limits. In addition to carrying freight traffic, I-10 is heavily utilized by local residents. Most commuters who live in the three coastal counties use this roadway to travel many of their trips. These commuters travel on I-10 until they reach a roadway that will take them south of I-10 to their place of employment (Coast Transit Authority and MDOT, 2011). Existing and new retail developments near I-10 interchanges throughout Harrison County have increased traffic, impacting the operations of the adjacent interchange ramps. Interchange improvements would be needed to maintain sufficient capacity to support the additional growth expected in future years (City of Biloxi, 2008b).

Table 5 presents the AADT volumes on I-10 within the study area from west to east of US 49. As indicated by the data, 2012 AADT volumes range from 39,000 to 75,000. In the case of I-10, not all locations exhibited a drop in traffic due to Hurricane Katrina (August 2005) or the 2008 national economic downturn.

Table 5
Historical Two-Way AADT on I-10 within Study Area

Jurisdiction	Location	2012	2011	2010	2009	2008	2007
Harrison County	West of Kiln-Delisle	39,000	38,000	41,000	41,000	40,000	41,000
Harrison County	West of Menge Avenue	44,000	44,000	54,000	54,000	53,000	50,000
Harrison County	West of County Farm Road	48,000	47,000	47,000	64,000	63,000	65,000
Harrison County	West of Canal Road	51,000	51,000	54,000	41,000	40,000	41,000
Gulfport	East of Canal Road	60,000	50,000	50,000	49,000	49,000	47,000
Gulfport	East of US 49	59,000	57,000	65,000	63,000	66,000	70,000
Gulfport	East of Lorraine Road	70,000	69,000	71,000	62,000	61,000	60,000
Biloxi	West of Cedar Lake Road	75,000	74,000	74,000	72,000	88,000	91,000
D'Iberville	West of I-110	66,000	65,000	65,000	59,000	60,000	62,000

Source: MDOT (2012).
Underlined volumes are actual traffic counts, others are estimated from trends by MDOT.

1.1.3.1.3 US 90

US 90 runs east-west along the Mississippi Gulf Coast. It provides a connection from Harrison County across the St. Louis Bay to New Orleans and Biloxi Bay to Pascagoula (Harrison County, 2008). US 90 is considered a primary east-west arterial. Many commuters that originate from the southern parts of the Gulf Coast will often travel US 90 to their places of employment (Coast Transit Authority and MDOT, 2011). Due to its close proximity to the beach, this roadway is heavily utilized by tourists.

The traffic conditions that existed on US 90 immediately prior to Hurricane Katrina in 2005 included daily traffic volumes over 48,000 with "Level of Service " (LOS) ranging from E and F (MDOT, 2008; see Section 1.1.5 for further details on LOS). As noted in Table 6, traffic volumes on US 90 in 2012 ranged from 23,000 to 31,000 within the study area. For many of the locations identified in Table 6, traffic volumes are below their 2007 levels. The lower AADT volumes are likely due to the damage to coastal development by Hurricane Katrina. The recovery to pre-Katrina levels has likely been impeded as a result of the economic recession and the low level of rebuilding along the beach for both commercial and residential buildings. In fact, 2012 traffic levels still indicate no growth.

Table 6
Historical AADT (two-way) on US 90 within the Study Area

Jurisdiction	Location	2012	2011	2010	2009	2008	2007
Gulfport	West of 38th Avenue	23,000	23,000	19,000	19,000	19,000	30,000
Gulfport	East of 30th Avenue	26,000	26,000	28,000	26,000	22,000	22,000
Gulfport	East of 20th Avenue	25,000	26,000	26,000	25,000	18,000	20,000
Gulfport	West of Kelly Avenue	27,000	27,000	27,000	26,000	20,000	22,000
Gulfport	East of Hewes Avenue	27,000	31,000	32,000	31,000	20,000	22,000
Gulfport	West of Teagarden Road	27,000	26,000	27,000	32,000	33,000	34,000
Gulfport	West of Cowan Road	24,000	24,000	24,000	24,000	25,000	26,000
Gulfport	East of Anniston Avenue	31,000	31,000	31,000	30,000	31,000	32,000
Biloxi	East of Debuys Road	23,000	23,000	23,000	29,000	29,000	30,000

Source: MDOT (2012).
Underlined volumes are actual traffic counts, others are estimated from trends by MDOT.

1.1.3.1.4 Other Study Area Roads

Table 7 summarizes the traffic count history among other study area roads that could be used by commuters or trucks accessing the Port. Trucks traveling to and from the Port currently use US 49 from I-10 to 28th Street or 25th Street, then travel west to 30th Avenue to access the Port. This route avoids the segment of US 49 through the Gulfport CBD thus avoiding impacts to commercial and tourism destinations in the CBD. Traffic count trends reveal no growth over the past 6 years.

Table 7
Historical AADT (two-way) on Other Gulfport Roads within the Study Area

Route	Location	2012	2011	2010	2009	2008	2007
Airport Road	East of US 49	14,000	18,000	18,000	18,000	18,000	18,000
Canal Road	South of I-10	12,000	13,000	13,000	13,000	13,000	15,000
Canal Road	North of 28th Street	14,000	14,000	9,800	9,700	9,800	10,000
Creosote Road	East of US 49	11,000	13,000	13,000	13,000	13,000	14,000
25th Street	East of 32nd Avenue	10,000	10,000	10,000	9,700	9,900	10,000
28th Street	East of Canal Road	10,000	10,000	11,000	11,000	11,000	11,000
28th Street	West of 33rd Avenue	11,000	11,000	13,000	13,000	13,000	15,000
28th Street	East of 33rd Avenue	9,400	9,400	9,400	11,000	11,000	12,000
28th Street	East of 30th Avenue	12,000	12,000	11,000	11,000	11,000	11,000
30th Avenue	South of 28th Street	5,500	5,500	7,200	7,000	7,200	7,100
30th Avenue	South of 25th Street	9,800	9,800	10,000	9,400	9,600	10,000
30th Avenue	South of 18th Street	3,300	3,300	10,000	9,400	9,600	10,000
30th Avenue	South of 15th Street	6,500	6,400	6,400	6,300	4,600	5,000
30th Avenue	South of 12th Street	7,600	7,600	8,900	8,700	8,900	10,000

Source: MDOT (2012).
Underlined volumes are actual traffic counts, others are estimated from trends by MDOT.

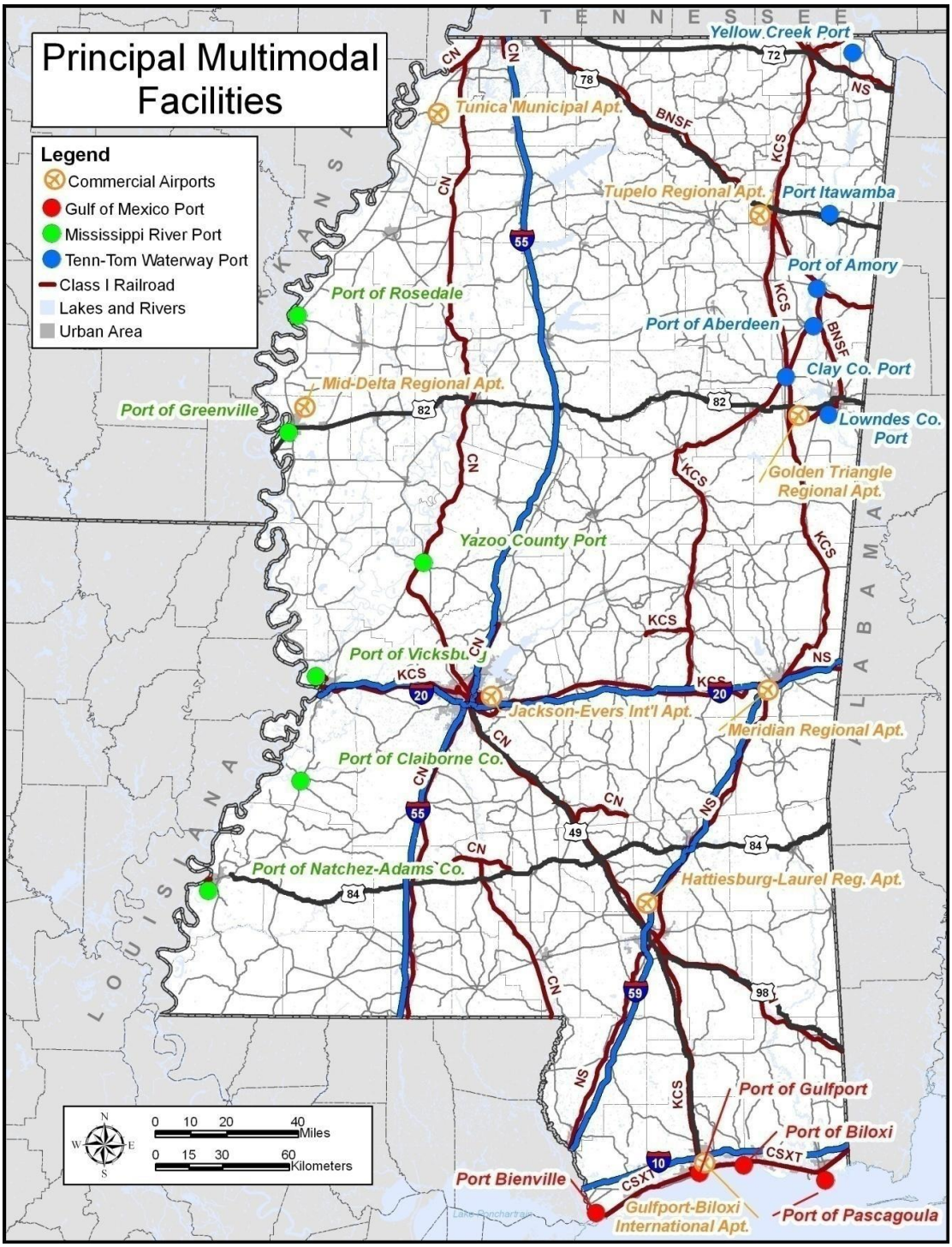
Canal Road is currently a two-lane undivided roadway from I-10 to 28th Street, and is part of one potential commuter route to reach the Port. 25th Street currently is a four-lane road with a two-way left-turn lane that provides a connection between US 49 and the main entrance to the Naval Construction Battalion Center military installation. 28th Street is currently a two-lane undivided roadway with left-turn lanes added at some intersections. 30th Avenue is a four-lane road that has different median treatments along its length. These include undivided, two-way left-turn lane and divided medians at different locations from 28th Street to US 90 at the main truck entry to the Port.

1.1.3.2 Railroads

The Port currently has three major tenants that handle containerized and bulk cargo: Dole, Crowley, and DuPont. A fourth tenant, McDermott, focuses on non-container terminal operations. As depicted on Figure 2, once unloaded, cargo has access to Class I rail systems (largest operating railroads) operated by KCS and CSX, which have connections to other commercial distribution modes throughout the state. Both lines are privately owned and operated (World Trade, 2010; Harrison County Development Commission, 2011).

KCS operates a 67.5-mile-long freight railroad on a north-south track from the Port to north of Hattiesburg. The KCS rail line is a single-track line that connects directly to the Port, and also provides turning tracks to access the east-west CSX rail line. The capacity of the line is constrained by the at-grade crossing between the KCS and CSX rail lines. From Gulfport to Perkinston, the KCS rail line is located to the west of US 49. In Perkinston, the KCS rail line shifts to the east side of US 49 (MDOT/FHWA, 2008). In Hattiesburg, the KCS rail line connects with the Norfolk Southern line that continues into the northeast U.S. and then connects to networks serving the entire eastern U.S. Also in Hattiesburg, the KCS rail line connects to the Canadian National line that continues to Chicago and Canada (*Gulfport News*, 2010).

Until recently, the KCS track could only accommodate 10-mph single stack container freight (263,000 pound gross rail load) and typically averaged one train per day (*Gulfport News*, 2010; MDOT/FHWA, 2008). In February 2010, Mississippi was awarded a $20 million Federal Transportation Investment Generating Economic Recovery (TIGER) grant as part of the ARRA to upgrade 67.5 miles of the line within the existing right-of-way to 49 mph double stack standards (*Gulfport News*, 2010). This project was completed in 2012 and is operational. Based on the KCS Rail Environmental Assessment methodology and an estimated existing demand of 223,740 TEUs per day with KCS rail improvements, an estimated 0.6 trains per day are generated by the Port to travel the KCS Rail line.



Source: MDOT (2011a).

Figure 2
Mississippi Water Ports, Airports, and Class 1 Railroads

The improvements to the KCS rail line increased the operating speed from 10 to 49 mph, accommodate 286,000 pound car loads, and increased the allowable train length from 2,940 to 3,900 feet north of the Gulfport Rail yard. South of the Gulfport Rail yard (between the Rail yard and the Port), 2,400 foot long trains will operate at 10 mph. The overall speed increase reduced the travel time from 8.5 to 3.75 hours, or a reduction of 4.75 hours over the length of the line. Table 8 presents the maximum (total closure time) at a rail-grade crossing while a train is present under different train speeds and allowable train lengths. Total crossing closure time per crossing can improve approximately 60% for trains traveling 10 mph compared to 30 mph. For trains at 49 mph, total closure time per crossing improves by approximately 70%.

Table 8
KCS Freight Rail – Estimated Total and Average Closure Time Scenarios

Allowable Train Length (feet)	Train Speed (miles per hour)	Train Speed (ft/sec)	Track Clearance Time (seconds)	Total Crossing Closure Time (seconds)
2,400	10	14.7	30	193
2,940	10	14.7	30	230.5
2,940	30	44.0	30	96.8
2,940	49	71.9	30	70.9
3,900	10	14.7	30	295.9
3,900	30	44.0	30	118.6
3,900	49	71.9	30	84.3

ft/sec = feet per second

The rail line speed upgrade affects the length of time any given train will block road crossings. At 49 mph, a 3,900-foot-long train will only block the crossing around 25 percent of the time that the same train would block it at 10 mph. Under the 49-mph operating speeds, rail-highway grade crossing delays are similar to those of street intersections under traffic signal control, and thus have less of an impact on roadway users. The duration of a given closure has a significant impact on roadway-railroad crossing delay due to the time required to dissipate the queue of traffic from the blockage.

In the downtown Gulfport area, the KCS rail line has at-grade rail crossings at US 90, 13th, 14th, 17th, 19th, 25th, and 28th streets. North of the downtown area, at grade rail crossings exist at 33rd Street, Martin Luther King Jr. Boulevard, Polk Street, Russell Boulevard, Factory Shop/Creosote Boulevard, and Landon Road. A rail yard extends from 33rd Street to the Martin Luther King Jr. Boulevard crossing. Only I-10 has grade-separated rail crossings at this time.

According to the KCS Rail Environmental Assessment Traffic Study Technical memorandum, trains up to 2,400 feet in length will travel at 10 mph from US 90 the Gulfport Rail Yard. It is not until after crossing I-10 that train speed can increase and eventually reach 49 mph. Before improvements to the KCS rail line, trains from the Port of Gulfport to the Gulfport Yard averaged 2,940 feet in length while

traveling at 10 mph. As seen in Table 9, while the KCS rail improvements will not increase the travel speed of trains from US 90 to the Gulfport Railyard, the improvements to the track do impact the length of the train.

Table 9
Train Conditions parallel to US 49

Existing Conditions	From	To	Allowable Train Length (feet)	Train Speed (miles per hour)	Train Speed (ft/sec)	Track Clearance Time (seconds)	Total Crossing Closure Time (seconds)
Before KCS Rail Improvement	US 90	Oneal Road	2,940	10	14.7	30	230
After KCS Rail Improvements	US 90	33rd Street	2,400	10	14.7	30	193
	33rd Street	Polk Street	3,900	10	14.7	30	296
	Polk Street	Dedeaux Road	3,900	20	29.3	30	163
	Dedeaux Road	Oneal Road	3,900	49	71.9	30	84

ft/sec = feet per second

Following the same methodology used in the KCS Rail Track Upgrade Project Environmental Assessment, which is consistent with both the U.S. Department of Housing and Urban Development (HUD)'s Environmental Assessment (EA) and the Federal Railroad Administration (FRA)'s Regulations for Considering Environmental Impacts, an impact assessment matrix (see Table 10) was created by Burk-Kleinpeter, Inc. (BKI). Impacts are considered in six categories: reach, character, probability, duration, frequency and within the existing capacity.

By 2060 the Port of Gulfport is projected to process approximately 1,050,000 TEUs under the No-Action conditions, comparatively under the Proposed Project conditions TEUs will increase to approximately 1,730,000. Additionally, by 2060, trucks transporting TEUs will decrease to approximately 50%. With improvement to the KCS track, each rail car can handle 4 TEUs. An allowed train length of 2,400 ft can support 37 railcars or 148 TEUs per each 2,400 ft train, with KCS track upgrades. As seen in Table 11, 2060 proposed Project conditions could experience 9 more trains traveling from the Port of Gulfport to the Gulfport Rail yard per day, considering 250 non-holiday work weekdays per year.

Table 10
Impact Assessment Matrix (Burk-Kleinpeter, Inc.)

Impact Category	Intensity of Impact	Definition of Intensity
Reach	International or National	Affects international or national trade patterns
	Statewide, Regional	Affects state or regional transportation
	Local or neighborhood	Delays that may affect single routes but not systems
Character	Permanent	Lasting effects on transportation system
	Temporary	Short-term affects attributed to construction
Probability	Certain	Impact is directly related to implementation of project
	Probable	Impact is not directly related to implementation of proposed project, but is likely to occur in the future
	Not Likely, but may occur	Impact is unrelated to project implementation, but may occur in the future
Duration	Excessive	16 minutes or more
	Long	11 to 15 minutes
	Medium	6 to 10 minutes
	Short	Up to 5 minutes
Frequency	Frequent	More than once per hour
	Often	More than four per day
	Intermittent	More than once per day
	Sporadic	More than four per week
	Rare	Fewer than four per week
Within Existing Capacity	Yes	Can be accommodated
	No	Cannot be accommodated

Table 11
2060 No-Action and Proposed Project Conditions

	2060 No-Action Conditions	2060 Proposed Project Conditions
Annual TEUs entering the Port of Gulfport	1,050,000	1,730,000
TEUs annually carried by Train (versus truck)	525,000	856,000
TEUs transported by train per weekday	2,100	3,460
Train Trips per weekday	14	23

TEU = twenty-foot equivalent unit

Reach, character, probability, and duration would all result in the same impacts for the study area under both the No-Action and Proposed Project conditions (Table 12). The frequency of train trips would increase between the No-Action and Proposed Project conditions by 9 trains per day; per BKI's Impact Assessment Matrix the frequency impact would remain classified as "often" for both conditions since more than four trains per day but less than more than one train per hour are anticipated. As shown in the KCS Rail Environmental Assessment, the existing crossings in the downtown Gulfport area are able to accommodate a queue of waiting cars at the grade crossings. With an increase of 9 trains per day, the corridor would still be able to accommodate queue lengths because of the decreased total closure time for each train crossing due to the KCS rail track upgrades. Between 2060 No-Action conditions and 2060 Proposed Project conditions, impacts would remain the same at at-grade crossings.

Table 12
TEU comparison between 2060 No-Action and Proposed Project Impact Assessment

Impact Category	2060 No-Action Conditions	2060 Proposed Project Conditions
Reach	Local or neighborhood	Local or neighborhood
Character	Permanent	Permanent
Probability	Certain	Certain
Duration	Short	Short
Frequency	Often	Often
Within Existing Capacity	Yes	Yes

At-grade railroad crossings were evaluated as part of a study conducted by Burk-Kleinpeter, Inc. et al. (2011) on June 14, 2011, as part of the EA for the KCS Railway Track Upgrade Project, Hattiesburg to Gulfport, Mississippi. Results indicated that although some delays would be experienced as a result of the proposed Project, those impacts are likely to be confined to the immediate vicinity of the rail line. Of the

92 rail grade crossings along the corridor, all but one can be accommodated within the existing transportation system with no improvements. The Landon Road crossing north of I-10 was expected to experience queues longer than the existing roadway could handle. However, the EA concluded this was a result of background growth and not a result of the updated rail operations. The study also concluded that crossing delays would decrease at 86 of 92 crossing locations for the entire length of the improved rail line due to the higher operating speed. In the downtown Gulfport area, at each of the at-grade rail crossings, the KCS rail line improvements decrease the total crossing closure time by approximately 37 seconds.

The CSX rail line provides transportation to the east and west. This rail line is the main Class I rail line that serves the Bienville and Pascagoula ports and provides connections to other regions outside of Mississippi. The CSX rail line services intermodal port terminals located at Gulfport and Pascagoula (Wilbur Smith Associates, 2009). Rail cars on the CSX rail line can run anywhere between 45 to 60 mph (Mississippi Public Broadcasting News, 2010).

The passenger service on this line also has an adverse impact on freight capacity (Wilbur Smith Associates, 2001). The *Sunset Limited* operates tri-weekly over CSX tracks along the Gulf Coast with stops at St. Louis Bay, Gulfport, Biloxi, and Pascagoula while traveling between New Orleans, Louisiana, and Jacksonville, Florida. This passenger rail service departs New Orleans heading eastbound Tuesday, Friday, and Sunday, and runs through most of Mississippi in the very early morning hours of the next day after departure. In the westbound direction, passenger trains pass through Mississippi in the early morning hours of Monday, Wednesday, and Friday (MDOT, 2011a).

1.1.4 Traffic Data Collection

Traffic counts at study area intersections were conducted on September 7, 2012, to support studies of specific roads, intersections, ramps, and entry points to the Port. These were collected to fill in areas not covered by MDOT counts, or to obtain detailed information about specific areas relevant to this study. The counts cover intersections along US 90 and US 49, as well as the ramps accessing I-10 from US 49 and Canal Road (Table 13). Year 2011 MDOT traffic counts on I-10 east of US 49 were used to determine through traffic volumes along I-10 from west of Canal Road to east of US 49. Counts were taken at all intersections that access the Port along US 90, all intersections with major four-lane roads along US 49, and the interchange ramps at I-10.

Table 13
List of Turning Movement Count Locations

Primary Roadway	Cross Road Location
Canal Road	I-10 Eastbound Ramps
Canal Road	I-10 Westbound Ramps
Canal Road	South of I-10 at Railroad Tracks
US 49	Landon Road/Crossroads Parkway
US 49	Creosote Road/Factory Shop Boulevard
US 49	Airport Road
US 49	25th Street
US 49	US 90
US 90	30th Avenue
US 90	Copa Boulevard
List of 24-hour Count Locations	
I-10 – US 49 Ramp	Eastbound I-10 to Northbound US 49
I-10 – US 49 Ramp	Southbound US 49 to Eastbound I-10
List of 48-hour Vehicle Classification Count Locations	
Canal Road	South of I-10 at Railroad Tracks
30th Avenue	South of US 90
Copa Boulevard	South of US 90
Captain James McManus Drive	At Entrance Gate to Port Property
I-10 – US 49 Ramp	Northbound US 49 to Eastbound I-10
I-10 – US 49 Ramp	Northbound US 49 to Westbound I-10
I-10 – US 49 Ramp	Eastbound I-10 to Southbound US 49
I-10 – US 49 Ramp	Westbound I-10 to Southbound US 49
US 49 Northbound	North of Northbound to Westbound I-10 Ramp
US 49 Southbound	North of Westbound to Southbound I-10 Ramp

Current Truck Access to I-10

Tractor trailer truck traffic volumes south of I-10 were compared between Canal Road and US 49 to determine which roadway is used by trucks the most. US 49 immediately south of I-10 handles over 2,300 tractor trailer trucks per day. The Canal Road count taken at a point south of the trucker motorist service area south of I-10 handles only 300 tractor trailer trucks per day.

General Turning Traffic Patterns at I-10 and US 49

The pattern of turning traffic at the I-10/US 49 interchange was determined from traffic count data to estimate the portion of truck and total traffic traveling in each direction from the Port. Of the overall volume of traffic on US 49 south of I-10 (53,730 vehicles per day), 19 percent travel to and from I-10 west, 23 percent to I-10 east, and 58 percent travel north on US 49. The pattern from tractor trailer trucks

is slightly different. Of the overall volume of tractor trailer trucks on US 49 south of I-10 (2,330 vehicles per day), 23 percent travel to and from I-10 west, 19 percent to I-10 east, and 58 percent travel north on US 49.

Measured Port of Gulfport Trip Generation Rates

Based on 24-hour traffic counts taken at all the entry roadways to the Port in September 2012, the Port currently generates 2,200 vehicle trips per day (1,100 per direction). The Port operations staff reported that the typical weekday truck traffic level is about 300 entering trucks per day for cargo. There are an additional 200 trucks per day that enter the site due to the construction activity on the West Pier, though this is a short-term situation. Table 14 summarizes the number of daily trips by type of vehicle.

Table 14
Port of Gulfport Measured Year 2012 Weekday Trip Generation by Vehicle Type

Type of Vehicle	Counted Weekday Trips	Percent of Daily Total Trips
Passenger Cars	1,300	59
Single Unit Trucks	400	18
Tractor Trailer Trucks (freight)	300	13
Tractor Trailer Trucks (construction)	200	10
Total	2,200	

Given that the 2012 annual volume of cargo is approximately 230,000 TEUs, the average trip generation rate of the Port (based on 2,000 non-construction trips) is roughly 870 daily trips (all vehicle types) per 100,000 annual TEUs. The highest volume of traffic counted during the morning peak hour includes 190 entering and 77 exiting vehicles. The highest volume of traffic counted during the evening peak hour includes 76 entering and 135 exiting vehicles.

Due to the varying size of shipping containers, the average number of TEUs accommodated by a tractor trailer truck is 1.7 as an industry standard. This factor was used to convert TEUs into truck trips. Also, 95 percent of freight traffic on the land-side of the Port is currently accommodated by trucks, with the other 5 percent by rail. The trip generation rate of passenger cars and single-unit trucks providing supplies and maintenance services is based on the traffic counts. The 1,700 passenger car and single-unit truck trips serve about 900 TEUs per weekday, which results in a weekday trip generation rate of about 1.9 trips per TEU.

1.1.5 Existing Traffic Conditions

The Project study area for roadway transportation impacts extends from Landon Road north of I-10 to US 90 on the south, and from US 49 on the east to Canal Road and 30th Avenue on the west. A traffic evaluation of year 2012 conditions was conducted to determine what directional roadway segments operate at an unacceptable LOS of E or F (see below) during peak hours. The evaluation was conducted

by direction of travel since traffic patterns and lane configuration can vary by direction. Table 15 summarizes the limits of each corridor included in the evaluation. Though other roads and intersections are included in the evaluation, they are minimally affected by traffic generated by the Port.

Table 15
Traffic Analysis Study Area Corridors, Limits, and Lengths

Corridor Name	Corridor Limits	Directional Length (miles)	Two-way Road Length (miles)
I-10 Freeway	West of Canal Road to East of US 49	8.10	4.05
US 49 (25th Avenue)	North of Landon Road to US 90	10.60	5.30
US 90 (Beach Blvd.)	West of 30th Avenue to East of US 49	2.60	1.30
Canal Road	Landon Road to 28th Street	6.90	3.45
25th Street	West of 30th Avenue to East of US 49	2.40	1.20
28th Street	West of Canal Road to East of US 49	6.80	3.40
30th Avenue	US 90 to 28th Street	2.90	1.45
Total Length (miles)	(all corridor segments)	40.20	20.10

The quality of traffic flow on a roadway facility is assessed using a qualitative performance rating called LOS. There are six LOS ratings that are depicted by the letters A through F. A description of what these qualitative measure mean is described below:

- LOS A is the best LOS and represents uncongested traffic with light traffic volumes;
- LOS C is normally the worst LOS tolerated in rural areas before improvements are warranted;
- LOS D is normally the worst tolerated in urban areas;
- LOS E represents traffic volumes near capacity; and
- LOS F is the worst, and represents congested traffic conditions due to traffic volumes that exceed the road's capacity.

The City of Gulfport, GRPC, and MDOT do not have thresholds requiring mitigation in order to address the impacts of new traffic generated by development As LOS D is widely considered the worst acceptable LOS tolerated in urban areas, LOS D or better was identified as the desirable level of service when evaluating whether traffic generated by the Proposed Project Alternative is significant compared to the No-Action Alternative; road segments operating at LOS E or F would be considered unacceptable. Table 16 summarizes how many directional miles of each major corridor in the study area operate at LOS E or F under 2012 traffic, along with the total directional mileage included in the evaluation. For example on 28th Street, 0.3 directional mile out of 6.8 directional miles operate at LOS E or F during the PM peak hour. This is the only unacceptable LOS of the 40.2 miles evaluated in the study area.

Table 16
Directional Road Miles at Level of Service (LOS) E or F
during 2012 AM and PM Peak Hour by Corridor

Year	Peak Hour	I-10	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue	Study Area
2012	AM Peak	-	-	-	-	-	-	-	-
2012	PM Peak	-	-	-	-	-	0.3	-	0.3
	Total Length	8.1	10.6	2.6	6.9	2.4	6.8	2.9	40.2

Table 17 identifies which segments of each corridor operate at LOS E or F and comments regarding potential causes. Only one intersection approach on 28th Street had a minor issues associated with traffic signal delay. Though there is sufficient capacity to accommodate 2012 traffic, the intersection carries traffic volumes that are fairly high for an intersection of two-lane roadways. Thus a long signal cycle time is the cause of the delay.

Table 17
Roadway Corridor Level of Service (LOS) Deficiencies – 2012 Existing Conditions

Corridor Name	Corridor Limits	Potential Cause of LOS E-F
I-10 Freeway	All LOS D or better	No issues
US 49 (25th Avenue)	All LOS D or better	No issues
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	All LOS D or better	No issues
25th Street	All LOS D or better	No issues
28th Street	AM LOS E, eastbound approaching Canal Road	Traffic signal delay due to long cycle time, capacity is adequate
30th Avenue	All LOS D or better	No issues

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2.0 ENVIRONMENTAL CONSEQUENCES

2.1 ROADWAY AND RAIL TRAFFIC

This section describes transportation system impacts of the proposed action associated with the Proposed Project Alternative relative to the No-Action Alternative. Transportation impacts are assessed under existing 2012 conditions, and under forecast conditions in the years 2020, 2040, and 2060.

2.1.1 Project Study Area

The Project study area for roadway transportation impacts extends from Landon Road north of I-10 to US 90 on the south, and from US 49 on the east to Canal Road and 30th Avenue on the west. This study area covers all roadways that can be used by Port commuters and trucks that access intercity highways such as I-10 and US 49. This study area also fully encompasses MDOT's planned I-310 Project and includes all roads that would be directly affected by its completion. MDOT's I-310 Project has been delayed, and it is unknown when the project will move forward. For evaluation purposes, it is assumed that the project would not be operational but cumulative effects of I-310 are assessed in Chapter 5 of the EIS.

2.1.2 Description of Alternatives

The proposed Project Alternative consists of enlargement of the terminal facilities to provide additional berthing and cargo handling capacity. Also, the expanded portion of the Port facility would be elevated up to 25 feet above mean sea level to help protect the Port infrastructure from hurricane storm surges.

Freight and passenger demand forecasts are based on an independent economic assessment of potential growth in freight container shipping. Table 18 summarizes current levels of containerized shipping and freight growth forecasts for the forecast years. The traffic evaluation conducted for this study considers the 2012 baseline condition, and the No-Action and Proposed Project Alternatives and forecast years.

Table 18
Port of Gulfport Existing and Forecasted Annual Shipping Container Volumes (TEUs)

	2010	2012	2020	2040	2060
No-Action Alternative (Baseline)	217,948	231,905	287,732	563,982	1,049,631
Proposed Project Alternative	217,948	231,905	487,732	963,982	1,725,215

TEU = twenty-foot equivalent unit

The baseline No-Action Alternative consists of no improvements to the Port beyond those previously approved. These improvements in conjunction with automation and other efficiency measures would allow container processing to increase from 230,000 TEUs in 2012 to 1,050,000 TEUs by 2060. The Proposed Project Alternative improvements expand berthing and processing area but make no

modifications to the shipping channel. This increases the throughput potential of the Port to 1,730,000 TEUs by 2060.

2.1.3 Background Traffic Forecasts

Background traffic growth attributed to regional population and employment growth was determined using the most recent official traffic forecasts from the Gulf Regional Planning Commission (GRPC). These forecasts were obtained in September 2012. Travel demand model forecasts were available for the years 2008 (calibration year), 2016, 2025, and 2035. Traffic growth levels for study area roads from these forecasts were used to determine future traffic levels in 2020, 2040, and 2060 for use in this study.

Previously identified traffic generation from the Port was subtracted from the GRPC model traffic patterns so that those associated with the Proposed Project Alternative defined in this study could be added. Port traffic demand associated with the Proposed Project Alternative was then added to determine the total traffic and associated traffic impacts. Separate traffic patterns were assigned for both light vehicles (passenger cars and small trucks) and heavy trucks.

Traffic forecasts for this study were developed both with and without MDOT's I-310 Project. The scenarios without the MDOT I-310 Project are used for impact evaluation and development of mitigation measures. The scenarios with MDOT's I-310 Project are used to evaluate cumulative effects.

2.1.4 Freight and Passenger Traffic Forecasts

The following sections describe the derivation of traffic forecasts for the No-Action and Proposed Project Alternatives and the different forecast years.

2.1.4.1 Trip Generation

Background traffic forecasts (excluding Port traffic) had been derived using a combination of traffic counts and the GRPC travel demand model for the study year of 2012 and the forecast years of 2020, 2040, and 2060. This section describes the process of estimating future traffic generation of the Port under the No-Action and Proposed Project Alternatives. Port trip generation was based on rates derived from actual traffic counts taken at all Port entry roadways in 2012.

2.1.4.1.1 Freight Truck Forecasts

Table 19 depicts freight tractor trailer truck forecasts for the Port. The average number of weekday trips was derived based on the projected number of TEUs per year. The annual TEUs were divided by 250 non-holiday work weekdays per year, and by 1.7 TEUs per truck trip. Also, the portion of TEUs carried by truck is forecasted to decline from the current 95 percent to 75 percent by 2020, and 50 percent by 2040 and beyond. These reductions are made possible by recently completed improvements to the KCS rail line. Despite reductions in truck mode share, the absolute number of truck trips is still expected to grow from 518 current trips to up to 2,030 trips in 2060 under the Proposed Project Alternative. Under the

No-Action Alternative, freight truck trips are still expected to grow to 1,235 per day. Thus, the Proposed Project Alternative growth scenario adds a maximum of 795 truck trips over the No-Action Alternative by 2060.

Table 19
Port of Gulfport Weekday Freight Truck Volumes and Forecasts by Scenario

	2010	2012	2020	2040	2060
Distribution Days per Year	250	250	250	250	250
Truck Mode Share	95%	95%	75%	50%	50%
Load Factor (TEUs/Truck)	1.7	1.7	1.7	1.7	1.7
Truck Trips per Weekday					
No-Action Alternative (Baseline)	487	518	508	664	1,235
Proposed Project Alternative	487	518	861	1,134	2,030

2.1.4.1.2 Freight Rail Forecasts

Table 20 depicts freight rail forecasts for the Port. Freight rail handles all land-side freight transport not accommodated by truck. So the average weekday trips were derived using some of the same assumptions as trucks. The rail portion of the annual TEU forecasts for the Port were computed by dividing the annual rail freight TEUs by 250 non-holiday work weekdays per year. Previously, the KCS rail line could only handle single-stacked container freight, thus limiting cargo loads to 2 TEUs per rail car. With the line improvement, the KCS rail line handles double stacked container freight, thus expanding the cargo load to 4 TEUs per rail car. According to the KCS Railway Environmental Assessment Traffic Study Technical memorandum, trains up to 2,400 feet in length will travel at 10 mph from US 90 to the Gulfport Rail Yard. North of the Gulfport Rail Yard, train lengths will increase up to 3, 900 feet and the train speed will increase and eventually reach up to 49 mph. Under previous conditions, train lengths were limited to 2,940 feet, or about 45 rail cars. With the line improvements, 2,400-foot trains with approximately 37 railcars from US 90 to the Gulfport Rail Yard and 3,900-foot trains with 60 rail cars north of the Gulfport Rail Yard can be accommodated. Under current conditions, the Port only generates one freight train every 2 days. Under the No-Action Alternative, the number of trains between the Port and the Rail Yard is expected to expand to nearly 14 trains per day by 2060. Under the Proposed Project Alternative, up to 23 trains per day are expected between the Port and the Rail Yard by 2060. North of the Rail Yard 9 trains are expected in 2060 under the No-Action Alternative and 15 trains are expected under the Proposed Project Alternative.

Table 20
Port of Gulfport Weekday Freight Rail Volumes and Forecasts by Scenario

		2010	2012	2020	2040	2060
Distribution Days per Year		250	250	250	250	250
Rail Mode Share		5%	5%	25%	50%	50%
Load Factor (TEUs/Rail Car)		2.0	2.0	4.0	4.0	4.0
Rail Cars per Weekday						
No-Action Alternative (Baseline)		22	23	72	282	525
Proposed Project Alternative		22	23	122	482	865
Allowable Train Length	From US 90 to the Gulfport Rail Yard	2,940	2,940	2,400	2,400	2,400
	North of the Gulfport Rail Yard	2,940	2,940	3,900	3,900	3,900
Rail Cars per Train	From US 90 to the Gulfport Rail Yard	45	45	37	37	37
	North of the Gulfport Rail Yard	45	45	60	60	60
Trains per Weekday						
No-Action Alternative (Baseline)	From US 90 to the Gulfport Rail Yard	0.5	0.5	1.9	7.6	14.2
	North of the Gulfport Rail Yard	0.5	0.5	1.2	4.7	8.8
Proposed Project Alternative	From US 90 to the Gulfport Rail Yard	0.5	0.5	3.3	13.1	23.4
	North of the Gulfport Rail Yard	0.5	0.5	2.0	8.0	14.4

2.1.4.1.3 Passenger Car and Service Truck Forecasts

Passenger demand to and from the Port consists of employees, equipment specialists, and other deliveries that are not directly associated with freight. Based on traffic counts conducted at all Port entry roads in 2012, it was determined that the Port generates the equivalent of 1.9 daily automobile and single unit truck trips per daily TEU. About 76 percent of these trips are passenger cars. The remaining 24 percent are single unit trucks associated with deliveries, equipment maintenance, repairs, and other functions that do not directly involve freight transport. Table 21 summarizes the weekday traffic forecasts associated with the No-Action and Proposed Project Alternatives. The volume of passenger car and single unit truck traffic generated by the Port is expected to grow from 1,760 vehicles per day in 2012 to 13,112 trips per day in 2060, based on the Proposed Project Alternative. This forecast conservatively assume no

improvements in productivity, which would normally reduce future traffic demand growth since fewer employees would be required per unit of freight processed.

Table 21
Port of Gulfport Forecasted Weekday Auto and Single Unit Truck Volume by Scenario

	2010	2012	2020	2040	2060
No-Action Alternative (Baseline)	1,656	1,762	2,187	4,286	7,977
Proposed Project Alternative	1,656	1,762	3,707	7,326	13,112

2.1.4.2 Port Freight and Passenger Travel Patterns

Freight truck traffic from the Port were distributed 42 percent to I-10 east, 28 percent to I-10 west, and 20 percent to US 49 north. Based on traffic counts, the current patterns of use for Port access roads by trucks is 89 percent to 30th Avenue, 2 percent to Copa Boulevard, and 9 percent to Capt. James McManus Drive.

Passenger car and service truck trips from the Port were distributed 14 percent to US 90 west, 24 percent to I-10 west, 8 percent to Canal Road north, 10 percent to US 49 north, 22 percent to I-10 east, 16 percent to US 90 east, and 1 percent each to Creosote Drive, Airport Road, and 25th Street/Pass Road east of US 49. Based on traffic counts, the current patterns of use for Port access roads by passenger cars and single-unit trucks is 53 percent to 30th Avenue, 16 percent to Copa Boulevard, and 31 percent to Capt. James McManus Drive.

Though Port commuters can use any of the roadways to access the Port, freight trucks are currently routed along 30th Avenue rather than US 49 through the Gulfport CBD. From 30th Avenue, either 25th or 28th Street are used to connect back to US 49 to complete the trip north to both I-10 and US 49 extending north of Gulfport into central Mississippi.

2.1.4.3 Traffic Forecasts by Scenario

The assessment of project impacts begins with a comparison of average daily traffic demand (including trucks) for the No-Action and Proposed Project Alternatives for the different forecast years. This comparison establishes the degree to which average traffic demands among the different scenarios vary by study area corridor. Table 22 summarizes the length-weighted average daily volume of traffic on each of the seven corridors in the study area affected by Port traffic demand. The No-Action Alternative (0) forecasts for the different forecast years indicate that background traffic growth produces most of the overall traffic growth. There is far less of an increase as a result of increased Port traffic levels from the No-Action traffic level to that of the Proposed Project Alternative. The Proposed Project Alternative increases traffic over the No-Action Alternative by up to 2,390 vehicles per day in 2060.

Table 23 summarizes the length-weighted average daily truck traffic demand levels on each of the seven corridors in the study area affected by Port traffic demand. The maximum overall increase would be expected to occur on US 49, where the average volume of trucks increases by 680 per day in 2060 between the No-Action Alternative and the Proposed Project Alternative.

Table 22
Average Daily Traffic by Corridor and Port Growth Scenario

Year	Alternative	I-10	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue
2012	No-Action	55,830	33,240	18,820	10,650	14,240	11,260	10,920
2020	No-Action	63,220	37,640	21,320	12,100	16,140	12,780	12,440
2020	Proposed Project	63,470	38,450	21,640	12,480	16,180	13,060	13,120
2040	No-Action	81,840	49,150	27,740	16,010	20,900	16,800	16,660
2040	Proposed Project	82,250	50,570	28,300	16,770	20,980	17,340	17,960
2060	No-Action	100,750	61,550	34,520	20,310	25,700	21,080	21,600
2060	Proposed Project	101,450	63,940	35,460	21,590	25,840	22,020	23,800

Table 23
Average Daily Truck Traffic by Corridor and Port Growth Scenario

Year	Alternative	I-10	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue
2012	Alt 0	6,840	1,860	800	600	1,140	540	500
2020	No-Action	7,720	2,030	880	680	1,300	620	540
2020	Proposed Project	7,850	2,340	1,000	680	1,300	620	620
2040	No-Action	9,980	2,630	1,140	880	1,680	800	700
2040	Proposed Project	10,160	3,040	1,320	880	1,680	800	800
2060	No-Action	12,400	3,600	1,560	1,080	2,040	980	940
2060	Proposed Project	12,700	4,280	1,840	1,080	2,040	980	1,100

2.1.5 Traffic Analysis Methodology

The impact of Port traffic on surrounding transportation facilities is determined using traffic analysis procedures derived from the *Highway Capacity Manual* (HCM). The HCM procedures combine traffic forecasts with a description of the roadway and traffic control devices like traffic signals to estimate transportation performance measures such as speed, traffic density, and delay. These performance measures are then compared to the standardized performance thresholds, LOS, to determine whether the level of performance is within acceptable limits. There are six LOS ratings that are depicted by the letters A through F. A description of what these qualitative measure mean is described in Section 1.1.5.

The No-Action Alternative is the baseline of comparison against the Proposed Project Alternative. This baseline represents the level of growth expected to occur if the Port remains as approved to be by current permits and no additional work under the jurisdiction of the USACE is performed. Thus, only additional auto, truck, and train traffic associated with the Proposed Project Alternative are assessed as impacts. The worst acceptable LOS tolerated in urban areas in this study is LOS D, thus, road segments operating at LOS E or F would be considered unacceptable.

2.1.6 Traffic Analysis Results

The traffic analysis results presented are based on the existing plus committed configuration of all the roadways in the study area. The committed improvements consist of two projects affecting 28th Street. The first project adds a two-way left-turn lane and minor intersection improvements from Canal Road to 30th Avenue. The second project widens 28th Street to four lanes with a two-way left-turn lane from 30th Avenue to US 49. Though there are other projects in the GRPC long-range transportation plan, these are the only ones in which funding has been confirmed, and thus, these represent the worst case development scenario. These two projects on 28th Street are expected to be completed by 2020. It should be noted that the GRPC long-range transportation plan is based on year 2035 traffic forecasts. Thus, the list of planned projects may not meet long-term transportation needs beyond that year. Since this study includes an evaluation of 2040 and 2060 traffic levels based on extrapolation of GRPC travel demand growth trends to 2035, results from this study are likely to identify additional transportation system improvement needs that are a result of long-term urban traffic growth more than they are of Port-related traffic growth.

Tables 24 and 25 summarize how many directional miles of each major corridor in the study area operate at LOS E or F under each year for the No-Action and Proposed Project Alternatives, along with the total directional mileage included in the evaluation. The Project study area includes 40.2 directional miles of major streets and highways. Those most impacted by the Port project include I-10, US 49, US 90, Canal Road, 25th Street, 28th Street, and 30th Avenue. Table 24 presents the AM peak hour, and Table 25 the PM peak hour. For example on 28th Street, 0.3 directional mile out of 6.8 directional miles operate at LOS E or F during the 2012 PM peak hour.

Table 24
Directional Road Miles at Level of Service (LOS) E or F
during AM Peak Hour by Year, Port Scenario and Corridor

Year	Alternative	I-10	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue	Study Area
2012	Alt 0	-	-	-	-	-	-	-	-
2020	No-Action	-	-	-	-	-	0.3	-	0.3
2020	Proposed Project	-	-	-	-	-	0.3	-	0.3
2040	No-Action	-	-	-	-	-	0.3	-	0.3
2040	Proposed Project	-	-	-	-	-	0.3	-	0.3
2060	No-Action	-	-	-	1.3	-	2.5	-	3.8
2060	Proposed Project	-	0.5	-	1.3	-	2.5	-	4.3
	Total Length	8.1	10.6	2.6	6.9	2.4	6.8	2.9	40.2

Table 25
Directional Road Miles at Level of Service (LOS) E or F during
PM Peak Hour by Year, Port Scenario and Corridor

Year	Alternative	I-10	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue	Study Area
2012	No-Action	-	-	-	-	-	0.3	-	0.3
2020	No-Action	-	-	-	-	-	0.3	-	0.3
2020	Proposed Project	-	-	-	-	-	0.3	-	0.3
2040	No-Action	-	-	-	1.3	-	0.3	-	1.6
2040	Proposed Project	-	-	-	1.3	-	0.3	-	1.6
2060	No-Action	-	0.5	-	1.3	-	2.7	-	4.6
2060	Proposed Project	-	0.7	-	1.3	-	2.7	0.2	5.0
	Total Length	8.1	10.6	2.6	6.9	2.4	6.8	2.9	40.2

During the AM peak hour in 2060, up to 4.3 of 40.2 directional miles operate at LOS E or F. During the PM peak hour in 2060, up to 7.2 directional miles operate at LOS E or F. Note that the length of roadways affected by Port traffic does not change from existing 2012 conditions to all the year 2020 scenarios. Results for 2040 No-Action and Proposed Project Alternatives are also the same. Results for 2060 No-Action and Proposed Project Alternatives differ. Thus, the same traffic issues and mitigation measures would apply to each of these scenarios in 2020 and 2040, but they will differ in 2060.

2.1.6.1 Traffic Impacts – 2020 No-Action and Proposed Project Alternatives

Table 26 identifies which segments of each corridor operate at LOS E or F for all 2020 scenarios (No-Action and Proposed Project Alternatives), and comments regarding potential causes. Of 40.2 directional miles studied, 0.3 mile are deficient. The results indicate that neither the Proposed Project Alternative, nor background traffic growth through 2020, would cause other roadway segments in the study area to experience a LOS worse than D, other than that of current 2012 conditions.

Table 26
Roadway Corridor Level of Service (LOS) Deficiencies –
2020 No-Action and Proposed Project Alternatives

Corridor Name	Corridor Limits	Potential Cause of LOS E and F
I-10 Freeway	All LOS D or better	No issues
US 49 (25th Avenue)	All LOS D or better	No issues
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	All LOS D or better	No issues
25th Street	All LOS D or better	No issues
28th Street	AM LOS F, eastbound approaching Canal Road	Intersection capacity
30th Avenue	All LOS D or better	No issues

Only the eastbound approach of 28th Street at Canal Road has a capacity issue. The west leg of this intersection carries a relatively high future traffic volume for a two-lane roadway. Since virtually no Port traffic uses this road segment, the capacity deficiency is due to background traffic growth between 2012 and 2020.

There is an unfunded GRPC long-range plan project to add a two-way left-turn lane to the west leg of this intersection. However, there is an intersection improvement that can help address the issue. The improvement consists of channelizing the eastbound through lane so that eastbound through traffic does not stop for the signal. This requires widening of the east leg to provide a median merge lane to receive southbound left turns from Canal Road. This improvement could be incorporated into the committed project that adds a two-way left-turn lane to 28th Street from Canal Road to 30th Avenue.

2.1.6.2 Traffic Impacts – 2040 No-Action and Proposed Project Alternatives

Table 27 identifies which segments of each corridor operate at LOS E or F for 2040 No-Action and 2040 Proposed Project Alternatives, and comments regarding potential causes. Of 40.2 directional miles studied, 1.6 miles are deficient. The results indicate that background traffic growth and growth associated with the No-Action Alternative increase demand such that two approaches to the intersection of Canal Road and 28th Street experience LOS worse than D. The same conclusion applies to 2040 conditions under the Proposed Project Alternative.

Table 27
Roadway Corridor Level of Service (LOS) Deficiencies –
2040 No-Action and Proposed Project Alternatives

Corridor Name	Corridor Limits	Potential Cause of LOS E and F
I-10 Freeway	All LOS D or better	No issues
US 49 (25th Avenue)	All LOS D or better	No issues
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	PM LOS E, southbound approaching 28th Street	Intersection Capacity
25th Street	All LOS D or better	No issues
28th Street	AM LOS F, eastbound approaching Canal Road	Intersection Capacity
30th Avenue	All LOS D or better	No issues

The two road segments that have and LOS worse that D are two of the approaches to the intersection of Canal Road and 28th Street. There are unfunded GRPC long-range plan projects to add two-way left-turn lanes to both the west and north leg of this intersection; however, these improvements do not address the intersection capacity issue. The intersection channelization improvement discussed in the previous section would help address the issue. However, a more permanent solution would involve one of the following:

- Add a long-range plan project to widen 28th Street to a four-lane roadway with a two-way left-turn lane or median from west of Canal Road to 30th Avenue, and to widen Canal Road to a four-lane roadway with a two-way left-turn lane or median from I-10 to 28th Street.
- Construct the planned I-310 freeway from I-10 to 28th Street to reduce traffic on 28th Street and Canal Road.
- Construct a surface arterial street in the MDOT I-310 Project right-of-way to reduce traffic on 28th Street and Canal Road.

The list of potential improvement options is mostly triggered by year 2040 background traffic growth. Port truck traffic would not use these roadways, and only 14 percent of Port employees access the Port via Canal Road and 28th Street.

2.1.6.3 Traffic Impacts – 2060 No-Action Alternative

Table 28 identifies which segments of each corridor operate at LOS E or F for the 2060 No-Action Alternative and comments regarding potential causes. Of 40.2 directional miles studied, 4.6 miles are deficient. The results indicate that background traffic growth and growth associated with the No-Action Alternative increase demand such that a section of US 49 and a longer section of 28th Street experience LOS worse than D.

As was the case with the Proposed Project Alternative, the combination of 2060 background traffic growth and Port employee traffic from the No-Action Alternative further increases demand on the intersection of Canal Road and 28th Street such that four-lane widening improvements identified in the previous section would be needed to achieve a meaningful increase in intersection capacity, and the low-

cost intersection channelization improvement would not provide sufficient relief. The widening of 28th Street would also address the intersection capacity issue on eastbound 28th Street at 30th Avenue since eastbound 28th Street currently has only one approaching lane to this intersection for through and right-turn traffic movements.

Table 28
Roadway Corridor Level of Service (LOS) Deficiencies – 2060 No-Action Alternative

Corridor Name	Corridor Limits	Potential Cause of LOS E and F
I-10 Freeway	All LOS D or better	No issues
I-10/US 49 Interchange	PM LOS E, westbound to southbound loop ramp	High traffic volume for loop ramp
US 49 (25th Avenue)	PM LOS F, northbound approaching 28th Street and southbound approaching 25th Street	Reduction in US 49 traffic lanes from 6 to 4 lanes at 28th Street
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	PM LOS E, southbound approaching 28th Street	Intersection Capacity
25th Street	All LOS D or better	No issues
28th Street	AM LOS F, eastbound and westbound approaching Canal Road	Intersection Capacity
28th Street	AM LOS F, eastbound approaching 30th Avenue	Intersection Capacity
30th Avenue	All LOS D or better	No issues

Capacity issues on US 49 pertain to the segment between 25th Street and 28th Street. US 49 transitions from six lanes north of 28th Street to four lanes from south of 28th Street to US 90. Though the US 49 roadway south of 28th Street is six lanes wide, the right lane in each direction is currently dedicated to right turns and as a buffer for on-street angle or parallel parking. The third lane in each direction can be restored by restriping the existing pavement and removing the angle parking. This change is only required for the quarter mile segment from 28th Street to a point south of 25th Street. Sections of US 49 farther south toward the beach and CBD operate at an acceptable LOS with four lanes.

Finally, the volume of traffic using the I-10 westbound loop exit ramp to southbound US 49 results in LOS E operations during the PM peak hour in 2060, mostly due to background traffic growth. Loop ramps have less capacity than other single lane ramps due to their lower operating speed and due to weaving traffic at either end of the ramp at cloverleaf interchanges. There are planned projects that could address this issue, though they are not committed at this time for different reasons. One project is I-310, which would divert much of the traffic from this ramp that is destined for the Gulfport CBD and Port. The other is a planned new I-10 interchange east of US 49 that would connect with Airport Road at the northeast end of the Gulfport-Biloxi International Airport. This interchange would also attract I-10 traffic from the US 49 interchange. Other options involve modifications to the I-10/US 49 interchange. One low-cost modification involves closing the loop ramp and adding two left-turn lanes from the existing

westbound I-10 to northbound US 49 ramp such that this ramp can also be used for left turns via a new signalized ramp intersection on US 49.

2.1.6.4 Traffic Impacts – 2060 Proposed Project Alternative

Table 29 identifies which segments of each corridor operate at LOS E or F for 2060 for the Proposed Project Alternative and comments regarding potential causes. Of 40.2 directional miles studied, 5.0 miles are deficient. The results indicate that background traffic growth and growth associated with the Proposed Project Alternative increase demand such that, in addition to previously noted LOS deficiencies, a longer length of US 49 and a portion of 30th Avenue also experience LOS worse than D.

Table 29
Roadway Corridor Level of Service (LOS) Deficiencies –
2060 Proposed Project Alternative

Corridor Name	Corridor Limits	Potential Cause of LOS E and F
I-10 Freeway	All LOS D or better	No issues
I-10/US 49 Interchange	PM LOS E, westbound to southbound loop ramp	High traffic volume for loop ramp
US 49 (25th Avenue)	PM LOS F, northbound approaching 28th Street and southbound approaching 25th Street	Reduction in US 49 traffic lanes from 6 to 4 lanes at 28th Street
US 49	PM LOS E, southbound approaching Creosote Road	Intersection Capacity
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	PM LOS E, southbound approaching 28th Street	Intersection Capacity
25th Street	All LOS D or better	No issues
28th Street	AM LOS F, eastbound and westbound approaching Canal Road	Intersection Capacity
28th Street	AM LOS F, eastbound approaching 30th Avenue	Intersection Capacity
30th Avenue	AM LOS E, northbound approaching 25th Street	Intersection Capacity

The added traffic from 2060 for the Proposed Project Alternative improvements to the Port result in LOS E or F at two intersection approaches in addition to those identified for the 2060 No-Action Alternative. The northbound approach of 30th Avenue at 25th Street reaches LOS E. This situation could be mitigated by adding a northbound right-turn bay.

The second affected approach is southbound US 49 approaching Creosote Road, which is the first traffic signal south of I-10. A second left-turn lane from southbound US 49 to eastbound Creosote Road could be added after planned widening of Creosote Road is complete. A project to expand Creosote Road

between US 49 and Three Rivers Road from two to four through lanes is part of the GRPC long-range plan.

2.1.7 Traffic Mitigation Measures

Previous sections identified specific road segments whose LOS declines to unacceptable levels (LOS E or F) due to traffic growth and presented roadway improvements that could restore traffic operations to LOS D or better. This section organizes the list of roadway improvements to identify those that might be a direct result of new traffic generated by the Proposed Project Alternative. Those that are a product of background traffic growth in the Gulf Coast urbanized area and growth in shipping activity constrained by previously approved expansion actions are initially identified so that those explicitly resulting from the Proposed Project Alternative can be separated.

2.1.7.1 Traffic Mitigation – No-Action Alternative

Even if Port expansion is limited to previously approved actions, Port traffic demand is still expected to grow, but at a lower rate due to lack of the proposed improvements that could help attract more tenants and other shipping to the Port. Table 30 summarizes which road network improvements would be needed even if the Proposed Project Alternative does not occur in 2020, 2040, and 2060.

Table 30
Roadway Improvement Needs – No-Action Alternative

Year Needed	Corridor Name	Location	Potential Improvement	Comments
2020	28th Street	Canal Road Intersection	Eastbound Channelized Through Lane	Could be included with the committed LRP project to add TWLTL to 28th Street from Canal Road to 30th Avenue
2040	28th Street	West of Canal Road to 30th Avenue	Widen 28th Street to 4 lanes with TWLTL	New project needed to handle regional traffic growth beyond 2035 GRPC LRP
2040	Canal Road	28th Street Intersection	Add second southbound left-turn lane	Could be included with uncommitted LRP project to add TWLTL to Canal Road from south of I-10 to 28th Street
2060	US 49	25th Street to south of 28th Street	Eliminate on-street parking, restripe existing roadway from 4 to 6 lanes	Low cost project
2060	I-10/US 49 Interchange	Westbound to southbound loop ramp	Close loop ramp, construct left-turn lanes on existing westbound to northbound ramp, add traffic signal to US 49 for left-turn lanes.	New project needed to handle regional traffic growth beyond 2035 GRPC LRP if planned new I-10 interchanges are not built (Airport Road or I-310)

LRP = Long-range Plan; TWLTL = two-way left-turn lane; GRPC = Gulf Regional Planning Commission

2.1.7.2 Traffic Mitigation – Proposed Project Alternative

Table 31 summarizes the roadway improvements that would be needed in addition to the No-Action Alternative improvements due to additional traffic generated by the Proposed Project Alternative. No additional improvements would be needed in 2020 or 2040.

Table 31
Roadway Improvement Needs – Proposed Project Alternative

Year Needed	Corridor Name	Location	Potential Improvement	Comments
2060	30th Avenue	Northbound at 25th Street	Add northbound right-turn bay	Low cost project
2060	US 49	Southbound at Creosote Road	Widen roadway to add second southbound left-turn lane	Depends on uncommitted GRPC LRP project to widen Creosote Road to 4 lanes from US 49 to Three Rivers Road

LRP = Long-range Plan; GRPC = Gulf Regional Planning Commission

3.0 CUMULATIVE IMPACTS

3.1 REASONABLY FORESEEABLE FUTURE ACTIONS

3.1.1 Transportation System Actions

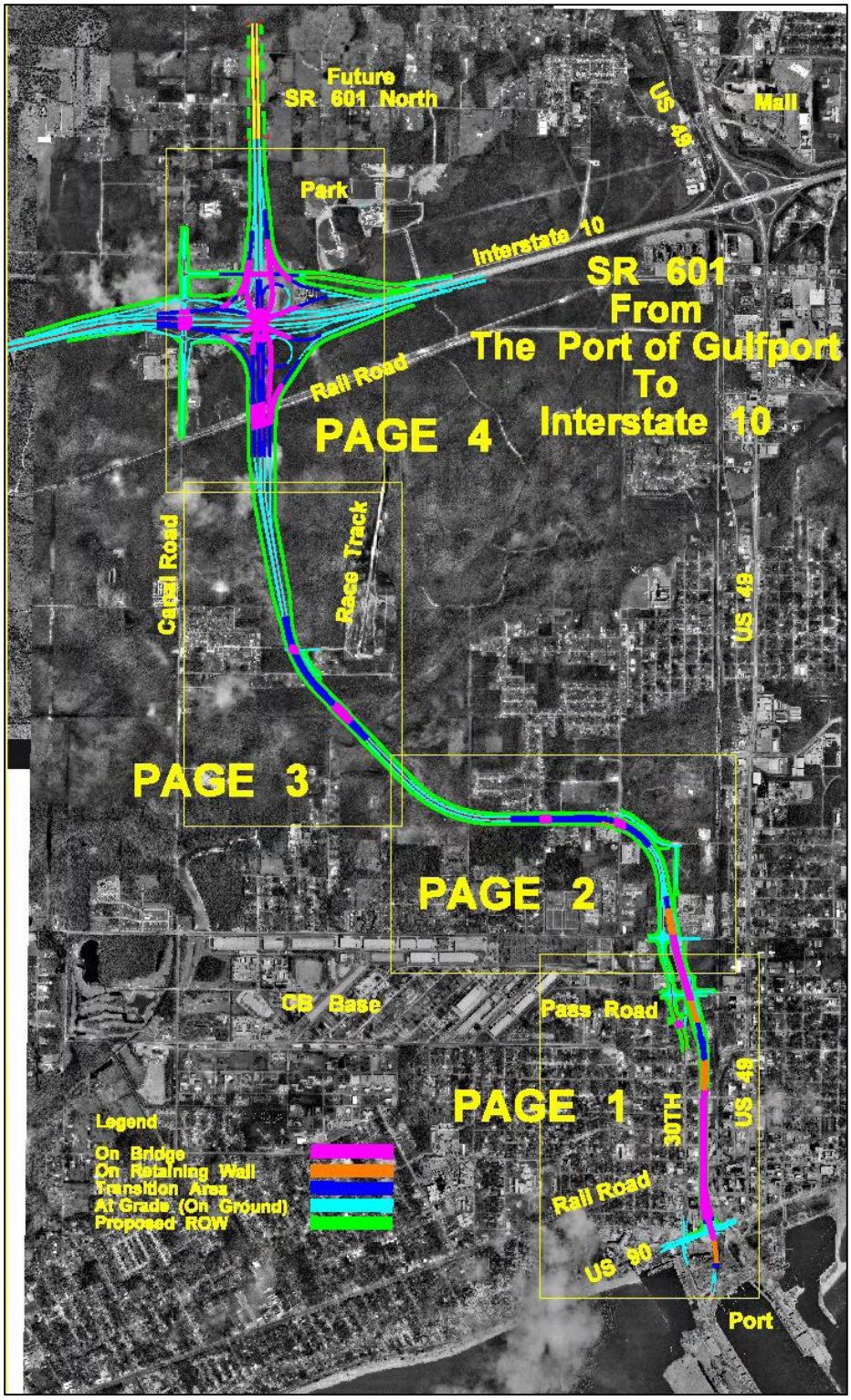
Future potential transportation-related actions that could affect transportation findings pertaining to the Proposed Project Alternative are listed below:

- Future I-310 (also called SR 601 South, Harrison County Connector or Port Connector Highway)
- SR 601 North (also called the Gulfport to Hattiesburg Highway otherwise following on or parallel to US 49)
- Unfunded GRPC LRP Urban Street Projects

Though the MDOT I-310 Project is currently postponed due to legal action, MDOT continues to move forward with the resolution of environmental issues, and plans to construct the highway when the issues have been resolved. Since I-310 would benefit the Port through direct access to an interstate highway, an evaluation of transportation conditions with I-310 is included in this document as an assessment of cumulative impacts. Since SR 601 North and the other GRPC LRP urban street projects are not currently funded, these are excluded from the evaluation to be conservative. Both SR 601 North and many of the unfunded urban street projects would provide benefits by relieving congestion and providing alternate routes for certain local traffic movements, which would reduce traffic on major thoroughfares like I-10 and US 49.

3.1.1.1 Future I-310

I-310 is a planned four-lane access controlled freeway between US 90 at the Port and I-10 near Canal Road. Also referred to as Mississippi Highway 601 south and the Canal Road-Port Connector Highway in older documents, it is proposed to begin at a new interchange with I-10 that will also serve as the southern terminus of the proposed US 49 Gulfport to Hattiesburg Freeway (also known as Mississippi Highway 601 North). South of I-10, I-310 would connect to a split diamond interchange at 25th/28th streets to access the Gulfport CBD and the Naval Construction Battalion Center military installation. A half diamond would connect with US 90 farther south to provide access to the beach front and commuter access to the southern reaches of the Gulfport CBD. I-310 would then enter the Port to provide direct access for trucks and Port employees. Figure 3 presents a conceptual layout of the proposed project (MDOT, 2006). Once constructed, I-310 is expected to relieve congestion on US 49 by providing an alternative route for tourists destined for beach front attractions, workers of the Gulfport CBD, including the Naval Construction Battalion Center, and for trucks traveling between the Port and I-10 and points farther north (Harrison County Development Commission, 2011). In fact, Port-related trucks will be required to use I-310 upon its completion according to commitments made by MSPA (2011b).



Source: MDOT (2006).

Figure 3
Conceptual Layout of Future I-310 Project

During environmental studies of I-310, the Gulfport Metropolitan Planning Organization year 2020 traffic forecast predicted I-310 would draw 20,000 vehicles per day south of I-10. US 49 currently carries up to 58,000 vehicles per day among the sections south of I-10 (see Table 1). The route also will serve as an additional hurricane evacuation route.

A Federal funding allocation of $6.4 million was obligated to the corridor under the name "Canal Road Intermodal Connector" in Gulfport (high priority project number 2348) by Federal legislation authorizing the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) transportation funding program (Public Law 109-59-August 10, 2005). According to a March 2011 news release from the MDOT public affairs office, "MDOT is nearing completion of the clearing phase of work for the new 5.8-mile Highway 601 construction project. The $1.14 million project was awarded to Gulf Equipment Corporation of Theodore, Alabama" (MDOT, 2011b). This clearing work pertains to the segment between Canal Road and 28th Street and has been completed.

The I-310 had been environmentally cleared in the final Environmental Assessment (Parsons Brinckerhoff Quade and Douglas, Inc., 2003). However, a permit associated with environmental mitigation had been revoked on November 21, 2012, by legal action, thus placing implementation of the corridor on hold. MDOT still plans to complete the roadway; thus for purposes of this study, improvement scenarios associated with the Port are evaluated both with and without completion of I-310 between I-10 and the Port. This comparative evaluation of cumulative impacts assumes full completion of MDOT's I-310 Project by 2020. An evaluation of traffic impacts is based on the same Port development alternatives in 2020 and 2060.

3.1.1.2 Traffic Forecasts by Scenario with I-310

The assessment of project impacts begins with a comparison of average daily traffic demand (including trucks) by scenario, where each scenario consists of a unique traffic forecast year and Port expansion alternative. This comparison establishes the degree to which average traffic demands among the different scenarios vary by study area corridor.

Levels of freight flow, trip generation, and external distribution patterns for the traffic scenarios that include I-310 are identical to those without I-310, except that traffic routes change to take advantage of the new highway. Traffic patterns accessing the Port change to take advantage of direct access to I-310.

With I-310 built, future patterns of use for Port access roads by trucks are 10 percent to 30th Avenue, 83 percent to I-310, zero to Copa Boulevard, and 7 percent to Capt. James McManus Drive. Future patterns of use for Port access roads by passenger cars and single-unit trucks are 23 percent to 30th Avenue, 50 percent to I-310, 11 percent to Copa Boulevard, and 12 percent to Capt. James McManus Drive.

Table 32 summarizes the length weighted average daily volume of traffic using each roadway corridor under both the no I-310 and with I-310 scenarios. Scenarios with I-310 consist of the last eight rows and

have traffic in the I-310 column, and cover only the years 2020 and 2060. Under the year 2020 scenarios, I-310 produces modest reductions in traffic on US 49 of 3,000 to 4,000 vehicles per day. However, in 2060, the reductions on US 49 range from 6,000 to 8,000 vehicles per day. I-310 also reduces traffic on the 30th Avenue corridor by 4,000 to 5,000 vehicles per day under both the 2020 and 2060 scenarios, and 8,000 to 10,000 vehicles per day under the 2060 scenarios.

Table 32
Average Daily Traffic by Corridor and Port Growth Scenario With and Without I-310

Year	Alternative	I-10	I-310	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue
2012	No-Action	55,830	-	33,240	18,820	10,650	14,240	11,260	10,920
Without I-310									
2020	No-Action	63,220	-	37,640	21,320	12,100	16,140	12,780	12,440
2020	Proposed Project	63,470	-	38,450	21,640	12,480	16,180	13,060	13,120
2060	No-Action	100,750	-	61,550	34,520	20,310	25,700	21,080	21,600
2060	Proposed Project	101,450	-	63,940	35,460	21,590	25,840	22,020	23,800
With I-310									
2020	No-Action	60,060	10,870	34,150	21,200	9,970	13,860	11,800	8,380
2020	Proposed Project	60,270	11,560	34,530	21,390	9,990	13,920	11,800	8,480
2060	No-Action	96,410	19,050	55,550	34,420	15,990	22,300	18,840	13,660
2060	Proposed Project	97,050	21,160	56,750	35,070	16,050	22,500	18,840	13,980

The key conclusion from these forecasts is as follows:

- Traffic increases due to background traffic growth from 2012 to 2020 and 2060 produce a majority of the change in traffic.

- Variations in traffic due to the Proposed Project Alternative are in the range of 140 to 2,400 vehicles per day or less among existing roads when comparing the No-Action Alternative to the Proposed Project Alternative. I-310 draws nearly 2,000 additional Port-generated vehicles per day for the Proposed Project Alternative versus the No-Action Alternative in 2060.

Table 33 summarizes the length-weighted average daily truck traffic demand levels on each of the seven corridors in the study area affected by Port traffic demand with and without I-310. With I-310, the maximum reduction on US 49 is 1,140 trucks per day in 2060 under the Proposed Project Alternative.

Table 33
Average Daily Truck Traffic by Corridor and Port Growth Scenario With and Without I-310

Year	Alter-native	I-10	I-310	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue
2012	No-Action	6,840	-	1,860	800	600	1,140	540	500
Without I-310									
2020	No-Action	7,720	-	2,030	880	680	1,300	620	540
2020	Proposed Project	7,850	-	2,340	1,000	680	1,300	620	620
2060	No-Action	12,400	-	3,600	1,560	1,080	2,040	980	940
2060	Proposed Project	12,700	-	4,280	1,840	1,080	2,040	980	1,100
With I-310									
2020	No-Action	7,430	810	1,810	750	460	960	660	340
2020	Proposed Project	7,510	1,010	1,880	770	460	980	660	360
2060	No-Action	11,970	1,520	2,980	1,210	730	1,550	1,050	560
2060	Proposed Project	12,150	1,970	3,140	1,230	730	1,570	1,050	620

3.1.1.3 Traffic Analysis Methodology

The impact of Port traffic on surrounding transportation facilities is determined using traffic analysis procedures derived from the HCM. The HCM procedures combine traffic forecasts with a description of the roadway and traffic control devices like traffic signals to estimate transportation performance measures such as speed, traffic density, and delay. These performance measures are then compared to the standardized performance thresholds, LOS, to determine whether the level of performance is within acceptable limits. Six LOS ratings are depicted by the letters A through F. A description of what these qualitative measure mean is described in Section 1.1.5.

In all cases, the No-Action Alternative is the baseline of comparison against the Proposed Project Alternative that involves a larger Port footprint. This baseline represents the level of growth expected to occur if the Port and channel remain as they are approved to be by current permits. Thus, only additional auto, truck, and train traffic associated with the Proposed Project Alternative is assessed as impacts. The City of Gulfport, GRPC, and MDOT do not have thresholds requiring mitigation in order to address the impacts of new traffic generated by development. As LOS D is widely considered the worst acceptable LOS tolerated in urban areas, LOS D or better was identified as the desirable level of service when evaluating whether traffic generated by the Proposed Project Alternative is significant compared to the No-Action Alternative; road segments operating at LOS E or F would be considered unacceptable.

3.1.1.4 Traffic Analysis Results

The traffic analysis results presented are based on the existing and committed configuration of all the roadways in the study area, except that comparative scenarios with MDOT's I-310 Project are included. The committed improvements consist of two projects affecting 28th Street. The first adds a two-way left-turn lane and minor intersection improvements from Canal Road to 30th Avenue. The second project widens 28th Street to four lanes with a two-way left-turn lane from 30th Avenue to US 49. Though there are other projects in the GRPC long-range transportation plan, these are the only ones in which funding has been confirmed, and thus, these represent the worst case development scenario. These two projects on 28th Street are expected to be completed by 2020.

It should be noted that the GRPC long-range transportation plan is based on year 2035 traffic forecasts. Thus, the list of planned projects is not likely to meet long-term transportation needs beyond that year. Since this study includes an evaluation of 2040 and 2060 traffic levels based on extrapolation of GRPC travel demand growth trends to 2035, results from this study identify additional transportation system improvement needs that are a result of long-term urban traffic growth more than they are of Port-related traffic growth.

Tables 34 and 35 summarize how many directional miles of each major corridor in the study area operate at LOS E or F by scenario both with and without I-310, along with the total directional mileage included in the evaluation. The project study area includes 53.7 directional miles of major streets and highways when I-310 is added. Those most impacted by the Port project include I-10, I-310, US 49, US 90, Canal Road, 25th Street, 28th Street, and 30th Avenue. Table 34 presents the AM peak hour, and Table 35 presents the PM peak hour. For example on 28th Street, 0.3 directional mile out of 6.8 directional miles operate at LOS E or F during the 2012 PM peak hour.

During the AM peak hour in 2060, construction of I-310 reduces the number of directional miles operating at LOS E or F from 4.3 to 1.6 miles. During the PM peak hour in 2060, I-310 reduces the number of directional miles operating at LOS E or F from 5.0 to 2.3 miles. Note that the length of roadways affected by Port traffic does not change from existing 2012 conditions to the year 2020 Proposed Project Alternative with I-310. The same is true of the Proposed Project Alternative 2060 scenario with I-310. Thus, the same traffic issues and mitigation measures would apply to each of these scenarios.

Table 34
Directional Road Miles at Level of Service (LOS) E or F
during AM Peak Hour by Scenario with and without I-310

Year	Alter-native		I-10	I-310	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue	Study Area
2012	No-Action	Existing	-	-	-	-	-	-	-	-	-
2020	No-Action	No I-310	-	-	-	-	-	-	0.3	-	0.3
2020	Proposed Project	No I-310	-	-	-	-	-	-	0.3	-	0.3
2060	No-Action	No I-310	-	-	-	-	1.3	-	2.5	-	3.8
2060	Proposed Project	No I-310	-	-	0.5	-	1.3	-	2.5	-	4.3
2020	No-Action	With I-310	-	-	-	-	-	-	-	-	-
2020	Proposed Project	With I-310	-	-	-	-	-	-	-	-	-
2060	No-Action	With I-310	-	-	0.5	-	-	-	1.1	-	1.6
2060	Proposed Project	With I-310	-	-	0.5	-	-	-	1.1	-	1.6

3.1.1.5 Traffic Impacts – 2020 No-Action Alternative and Proposed Project Alternatives

Table 36 identifies which segments of each corridor operate at LOS E or F for both 2020 scenarios (No-Action Alternative and Proposed Project Alternative) with I-310 built, and comments regarding potential causes. Of 57.3 directional miles studied, 0.3 mile are deficient. The results indicate that neither the No-Action nor the Proposed Project Alternative scenarios, nor background traffic growth through 2020 would cause other roadway segments in the study area to experience a LOS worse than D than that of current 2012 conditions. Thus, inclusion of I-310 does not change this situation relative to the scenarios without I-310.

Only the eastbound approach of 28th Street at Canal Road has a capacity issue. The west leg of this intersection carries a relatively high future traffic volume for a two-lane roadway. Since virtually no Port traffic uses this road segment, the capacity deficiency is due to background traffic growth between 2012 and 2020.

Table 35
Directional Road Miles at Level of Service (LOS) E or F
during PM Peak Hour by Scenario with and without I-310

Year	Alternative		I-10	I-310	US 49	US 90	Canal Road	25th Street	28th Street	30th Avenue	Study Area
2012	No-Action	Existing	-	-	-	-	-	-	0.3	-	0.3
2020	No-Action	No I-310	-	-	-	-	-	-	0.3	-	0.3
2020	Proposed Project	No I-310	-	-	-	-	-	-	0.3	-	0.3
2060	No-Action	No I-310	-	-	0.5	-	1.3	-	2.7	-	4.6
2060	Proposed Project	No I-310	-	-	0.7	-	1.3	-	2.7	0.2	5.0
2020	No-Action	With I-310	-	-	-	-	-	-	0.3	-	0.3
2020	Proposed Project	With I-310	-	-	-	-	-	-	0.3	-	0.3
2060	No-Action	With I-310	-	-	0.5	-	-	0.4	1.4	-	2.3
2060	Proposed Project	With I-310	-	-	0.5	-	-	0.4	1.4	-	2.3

Table 36
Roadway Corridor Level of Service (LOS) Deficiencies –
2020 No-Action and Proposed Project, Alternatives

Corridor Name	Corridor Limits	Potential Cause of LOS E-F
I-10 Freeway	All LOS D or better	No issues
US 49 (25th Avenue)	All LOS D or better	No issues
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	All LOS D or better	No issues
25th Street	All LOS D or better	No issues
28th Street	AM LOS E, eastbound approaching Canal Road	Intersection capacity
30th Avenue	All LOS D or better	No issues

There is an unfunded GRPC long-range plan project to add a two-way left-turn lane to the west leg of this intersection. However, there is an intersection improvement that can help address the issue. The improvement consists of channelizing the eastbound through lane so that eastbound through traffic does not stop for the signal. This requires widening of the east leg to provide a median merge lane to receive

southbound left turns from Canal Road. This improvement could be incorporated into the committed project that adds a two-way left-turn lane to 28th Street from Canal Road to 30th Avenue.

3.1.1.6 Traffic Impacts – 2060 No-Action and Proposed Project Alternative

Table 37 identifies which segments of each corridor operate at LOS E or F for all 2060 scenarios (No-Action Alternative and Proposed Project Alternatives) with I-310 built and comments regarding potential causes. Of 57.3 directional miles studied, 2.3 miles are deficient. The results indicate that even with I-310 built, background traffic growth and growth associated with the No-Action Alternative increase demand such that a section of US 49, a section of 25th Street, and a longer section of 28th Street experience LOS worse than D. Thus, inclusion of I-310 mitigates many of the previously noted deficiencies that occur without I-310. However, added traffic due to the Proposed Project Alternative does not result in additional deficiencies relative to the No-Action Alternative.

Table 37
Roadway Corridor Level of Service (LOS) Deficiencies –
2060 No-Action and Proposed Project Alternatives

Corridor Name	Corridor Limits	Potential Cause of LOS E-F
I-10 Freeway	All LOS D or better	No issues
US 49 (25th Avenue)	PM LOS F, northbound approaching 28th Street and southbound approaching 25th Street	Reduction in US 49 traffic lanes from 6 to 4 lanes at 28th Street
US 90 (Beach Blvd.)	All LOS D or better	No issues
Canal Road	All LOS D or better	No issues
25th Street	PM LOS F, eastbound approaching US 49	Intersection Capacity
25th Street	PM LOS F, westbound approaching I-310 NB Ramp	Intersection Capacity
28th Street	A M LOS F, eastbound approaching Canal Road	Intersection Capacity
28th Street	AM LOS F, eastbound approaching 30th Avenue	Intersection Capacity
30th Avenue	All LOS D or better	No issues

Completion of I-310 diverts Port commuter traffic growth formerly using both 28th Street west of 30th Avenue, and Canal Road from 28th Street to I-10, which mitigates the need for most improvements otherwise needed on these two corridors if I-310 is not built. In addition to the committed project to widen 28th Street from Canal Road to 30th Avenue to include a two-way left-turn lane, adding a short segment of a second eastbound through lane and an eastbound right-turn lane on the eastbound approach of 28th Street and 30th Avenue addresses the capacity issue at this intersection.

Capacity issues on US 49 pertain to the segment between 25th Street and 28th Street. US 49 transitions from six lanes north of 28th Street to four lanes from south of 28th Street to US 90. Though the US 49 roadway south of 28th Street is six lanes wide, the right lane in each direction is currently dedicated to right turns and as a buffer for on-street angle or parallel parking. The third lane in each direction can be

restored by restriping the existing pavement and removing the angle parking. This change is only required for the quarter mile segment from 28th Street to a point south of 25th Street. Sections of US 49 farther south toward the beach and CBD operate at an acceptable LOS with four lanes.

The impacted segment of 25th Street is between I-310 and US 49. This segment experiences added traffic due to diverted traffic patterns associated with the new I-310 ramps connecting to 25th Street. This issue can be mitigated by additional turn bays. The most beneficial turn bays include a second eastbound left-turn bay on 25th Street at US 49, and an advanced left-turn storage bay feeding the I-310 interchange at the planned intersection of I-310 northbound ramps and 25th Street. This latter advanced left-turn bay is intended to feed the left-turn bay for the southbound I-310 entrance ramp.

3.1.2 Traffic Mitigation Measures

Previous sections identified specific road segments whose LOS declines to unacceptable levels (LOS E or F) due to traffic growth, and presented roadway improvements that could restore traffic operations to LOS D or better assuming that I-310 is already built by 2020. This section organizes the list of roadway improvements to identify those that might be a direct result of new traffic generated by the Proposed Project Alternative. Those that are a product of background traffic growth in the Gulf Coast urbanized area and growth in shipping activity constrained by previously approved expansion actions are initially identified so that those explicitly resulting from the Proposed Project Alternative can be separated.

3.1.2.1 Traffic Mitigation – No-Action Alternative with I-310

Even if Port expansion is limited to previously approved actions, Port traffic demand is still expected to grow, but at a lower rate due to lack of the proposed improvements that could help attract more tenants and other shipping to the Port. Assuming I-310 does get built by 2020, Table 38 summarizes which road network improvements would be needed even if the Proposed Project Alternative does not occur in 2020 and 2060.

Table 38
Roadway Improvement Needs – No-Action Alternative

Year Needed	Corridor Name	Location	Potential Improvement	Comments
2020	28th Street	Canal Road Intersection	Eastbound channelized through lane	Could be included with the committed LRP project to add TWLTL to 28th Street from Canal Road to 30th Avenue
2060	28th Street	30th Avenue Intersection	Add second eastbound through lane and eastbound right-turn bay	Could be included with the other committed LRP project to improve 28th Street from Canal Road to US 49
2060	25th Street	US 49 Intersection	Add second westbound left-turn lane	Low cost project could be included with the I-310 project since the need is based on traffic patterns shifted by I-310
2060	25th Street	I-310 North-bound Ramp Intersection	Add westbound advanced left-turn storage lane	Could be included with the I-310 construction project
2060	US 49	25th Street to south of 28th Street	Eliminate on-street parking, restripe existing roadway from 4 to 6 lanes	Low cost project

3.1.2.2 Traffic Mitigation – Proposed Project Alternative with I-310

Added traffic resulting from the Proposed Project Alternative, does not result in the need for additional improvements beyond those required to sustain background traffic growth and Port traffic growth associated with the No-Action Alternative when I-310 is included in the transportation network.

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